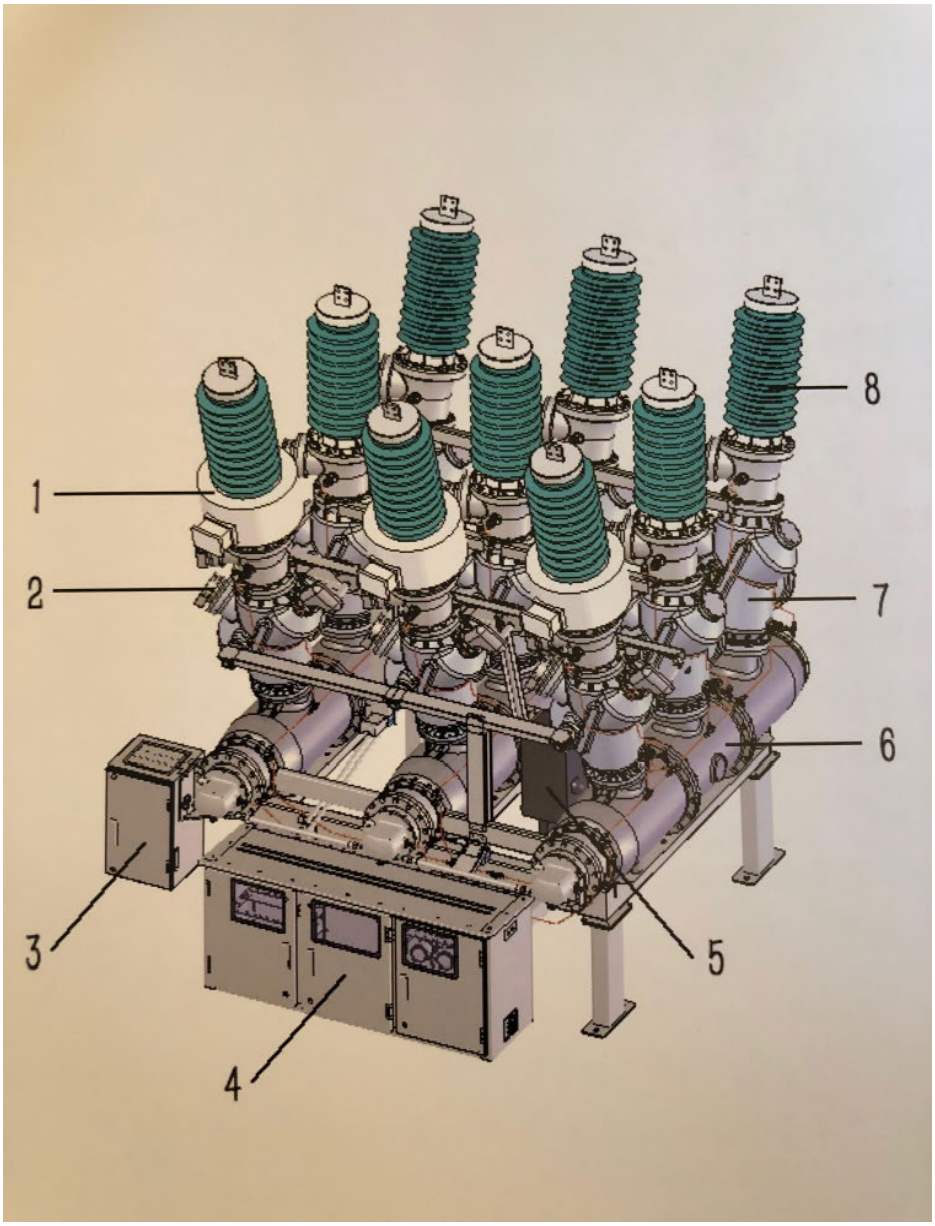
HUADE
SWITCHGEAR

CAT. 1126/HV/ 003

RATING: 72.5kV, 2500A , 31.5kA/3Sec

TYPE : H-72.5 ENVIROMENTALLY FRIENDLY (NON SF6) PASS SWITCHGEAR

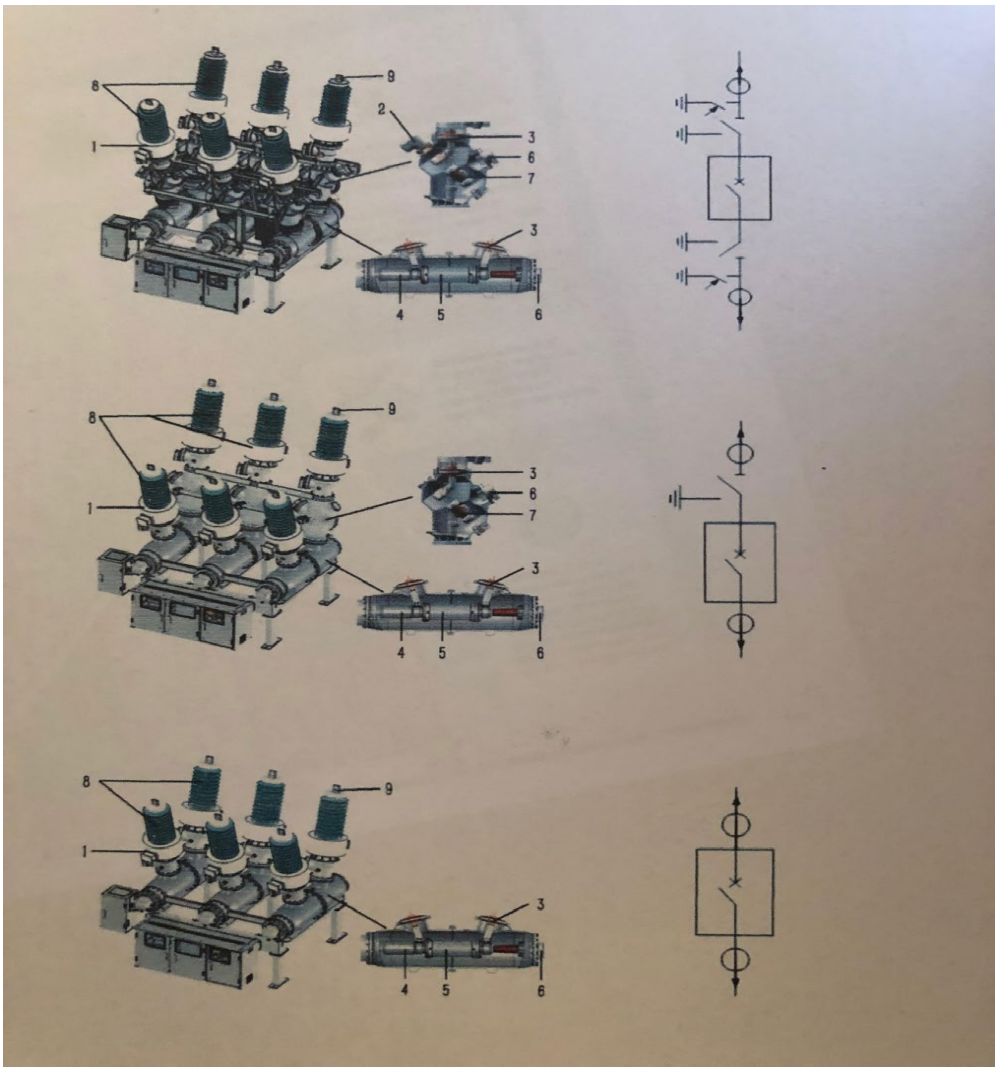
……HUADE Switchgear..Smart Switchgear……



1. Current transformer 2. Pressure Relief Valve 3.Spring Charge Mechanism

4. Three Phase Controller 5.Fast Earthing Switch 6.Vacuum Circuit Breaker

7. Three Position Switch 8. Composite Bushings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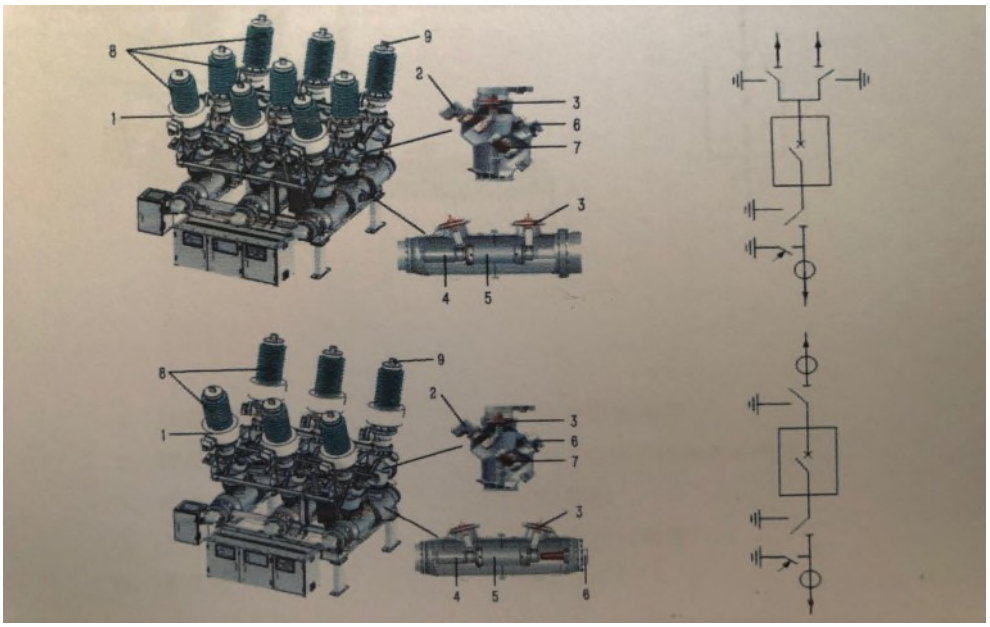
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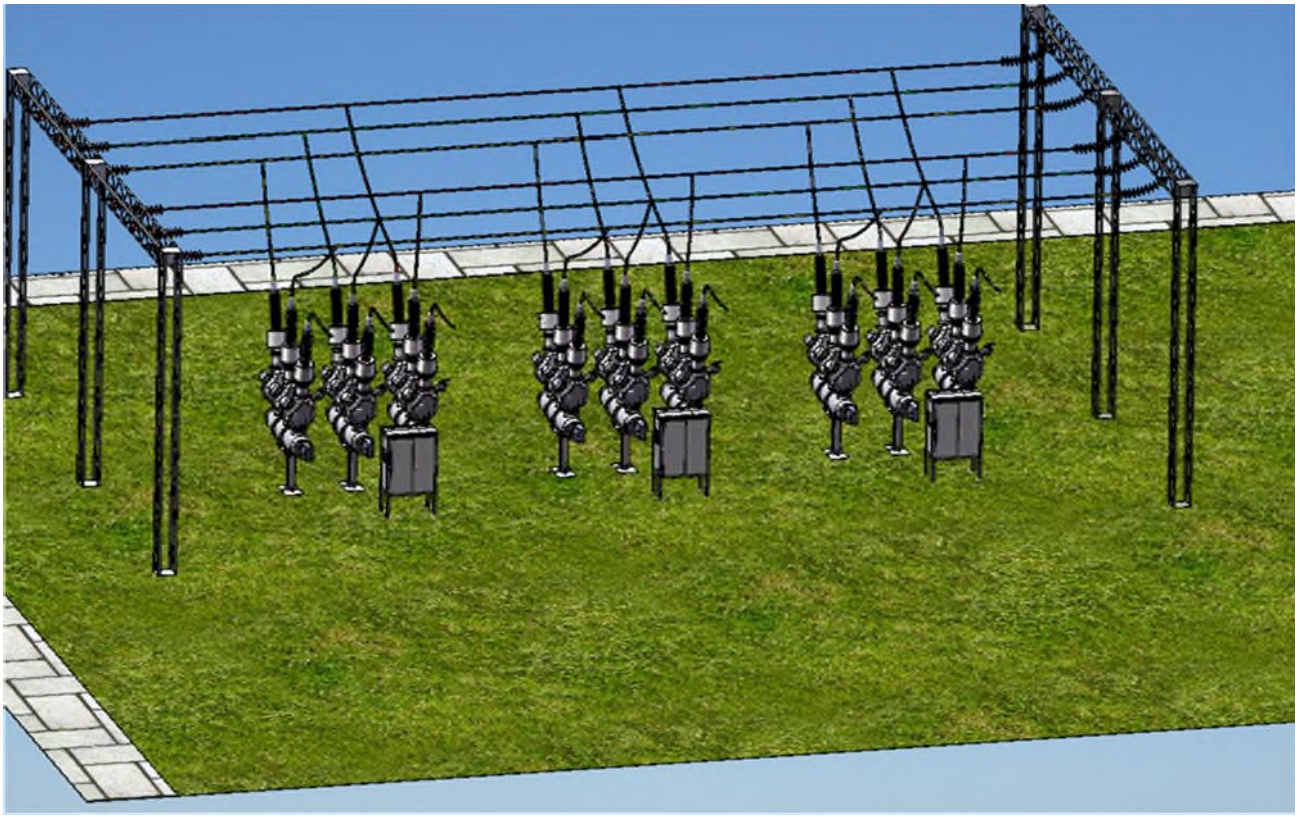


A highly compact switchgear of the "Plug and Switch System" type . (PASS)

It is filled with compressed air for Insulation . The circuit breaker is of Vacuum interrupter.

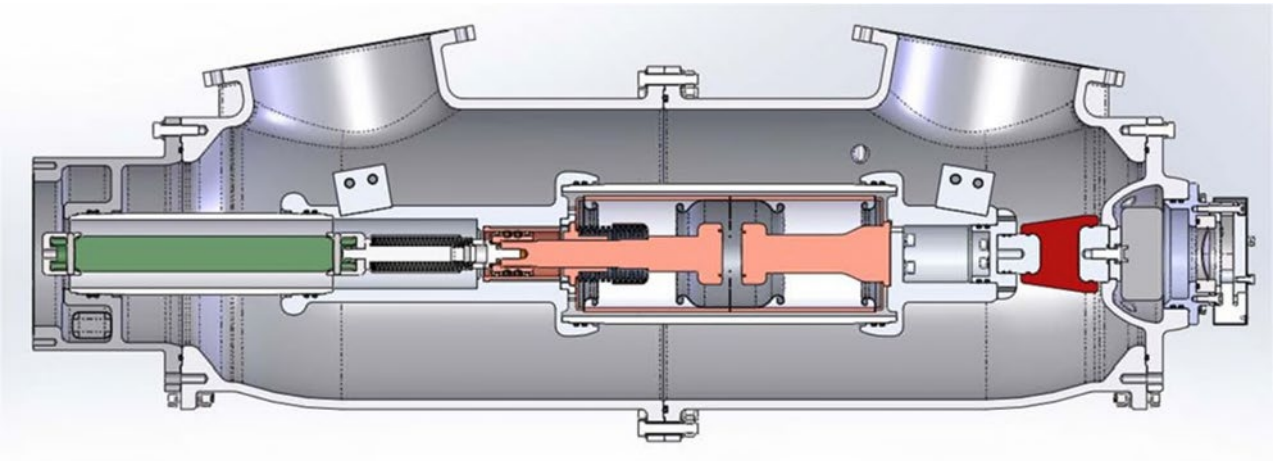
The drive mechanical system is spring Driven type.

The bushings are of Composite non -breakable materials

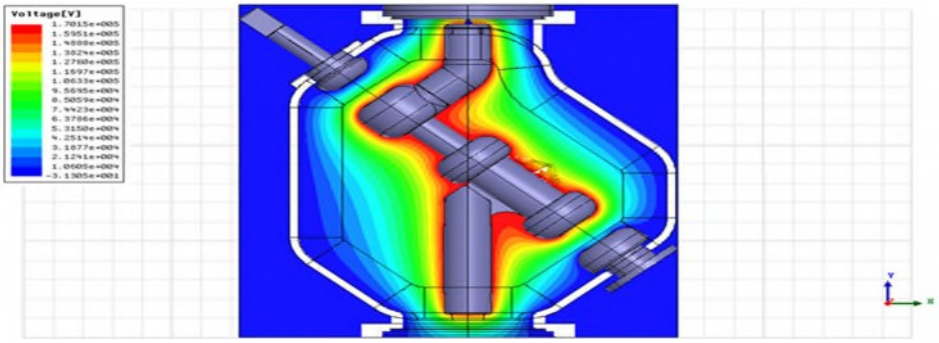
FEATURES

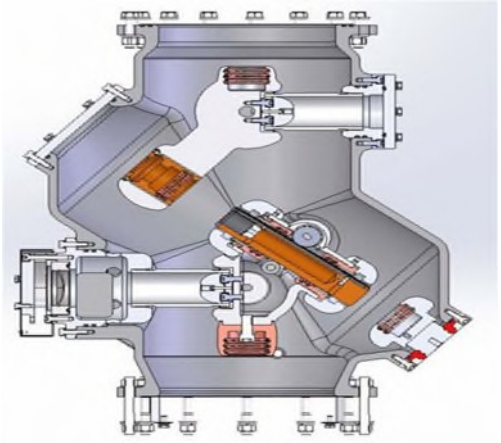
- **Single-phase gas-insulated housing filled with Compressed Air**
- **Comprising**
  Circuit breaker, combined disconnector and earthing switches
- **Voltage transformers ,current Transformers**
- **Fast earthing switch**
- **Plug in cables option**
- **Suitable for immediate installation.**
- **It is available in many different versions such as applications for single busbar, double busbar, H-configured switchgear bay, and suitable for many different configurations**
- **No need for separate support structures as in conventional AIS Switchgear**
- **No need for different overhead line connectors for Cb, CT , VT , and DS**
- **Very economical**
- **Small Foot Print**

INSIDE VIEW OF CIRCUIT BREAKER CHAMBER



3 -POINT DISCONECTOR EARTHING SWITCH





INSULATORS

Composite insulators are significantly lighter and less prone by strikes and blows than procelain insulators. for use in seismic areas, the sensitivitity to impact loads and the low weight are considerable advantages.

Additionally thanks to silicone‘s hydrophobic (water-repellent) properties, water just rolls off and does not develop a constant moisture film, specifically in highly polluted and coastal regions.

SPRING MECHANISM

Additionally, this H-72.5 DT series offers very stable operating times with minimal

risk of mechanical scatter, making the mechanism well suited for switching applications.

Interrupter Chamber

These circuit breakers use a proven innovative interrupter design with self-blast technology that significantly reduces the required mechanical energy to clear short-circuit currents. The interrupter design uses the arc energy to generate gas compression for the efficient quenching of the arc itself.

As a member of the puffer family, the interrupter has two gas volumes within the chamber, one mechanical and one thermal. The purpose of the interrupter ensures that the circuit breaker will interrupt short-circuit fault current from low level faults to the full nameplate rating.

The single-pressure interrupter uses partial duo-flow, self-blast technology

to control and cool the Compressed Air

exhaust, ensuring proper gas density and

dielectric strength while at the same time reducing the risk of contamination.

This design ensures long reliable life even as the circuit breaker ages with

time and use.

CB Housings

The interrupter housings are made as single-piece aluminum castings,

designed to ensure gas tightness and with safety margin for dielectric

strength.

TECHNICAL DATA

S/N	Description	Units	Values
1	Rated Voltage	kV	72.5
2	Rated Lightning Impulse Withstand Voltage (1.2 Micosec)	kV	380
3	Rated Power -frequency Withstand Voltage (1 Min)	kV	160
4	Rated Frequency	Hz	50/60
5	Rated Current	A	2500
6	Rated Short Circuit Breaking Current/ secs	kA	31.5/4
7	Rated Peak Withstand Current	kA	80
8	Sf6 Pressure at 20C	Mpa	0.5
9.	Dimensions	mm	2900 x 4150 x4000
10	Max PD	pC	5
11	Moisture	ppm	<<225
12	Classification		E2, M2,C1
13	Sequence		0-0.3s-CO-180s-CO
14	CB., Mechanical		10,000
	Electrical		20
15	DS (M1)		3000
	(E1)		2

IDEA OF SMART GRID

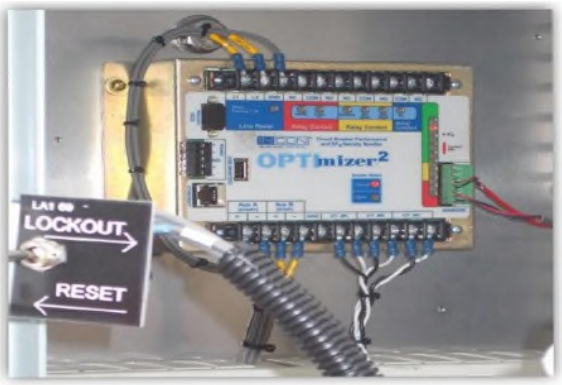
The trend for most Power Grids in the world is moving towards the idea of a SMART Grid concept , where the application of computer intelligence and networking abilities changes a "dumb" electricity distribution system to that of a " Smart " one . In the case of the former , the power utility will only know that service is lost only when a customer rings up to complain. In the case of a smart grid , however, if service is interrupted the power company will know right away because certain components of the grid e.g. smart meters in the affected area, stop sending data back to the control room . Hence if by ensuring that all the components of the power system from transformers to power lines to home electric meters are capable of two-way communication, able to send information of the real time status of the component , then the company can manage distribution of power very efficiently, be proactive about maintenance and respond to outages faster , sometimes even before it happening. .This is possible only if advance sensing and measurement technologies are available that will constantly inform the Control Engineers of the "health "of the system components such as that of a Distribution switchgear .

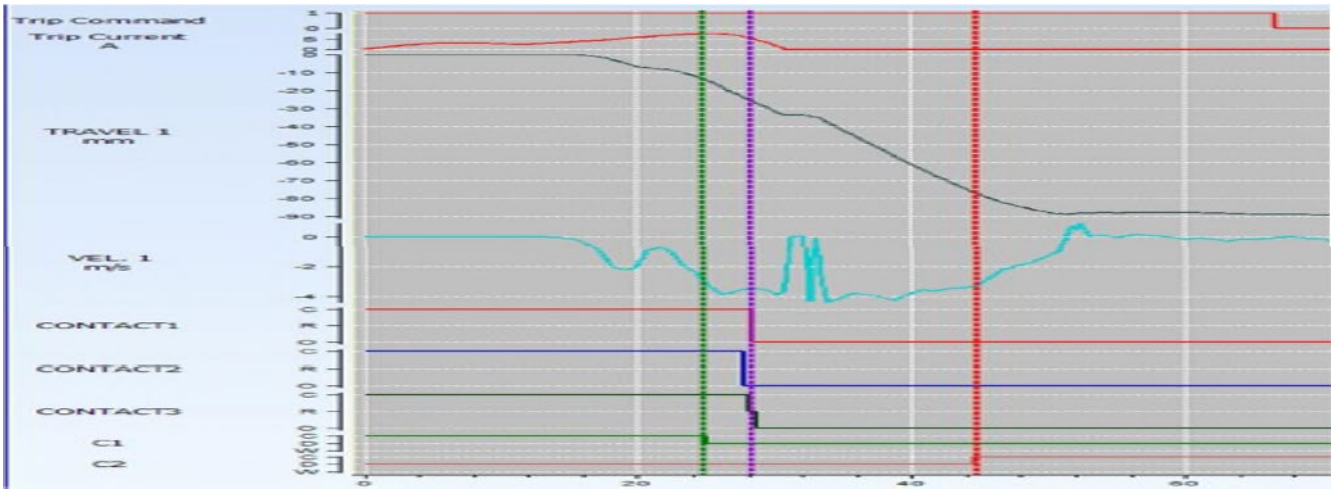
The intelligent H-72.5kV switchgear, a product development of Smith Switchgear sets the standard for such a modern intelligent switchgear .

INTELLIGENT SMART BREAKER

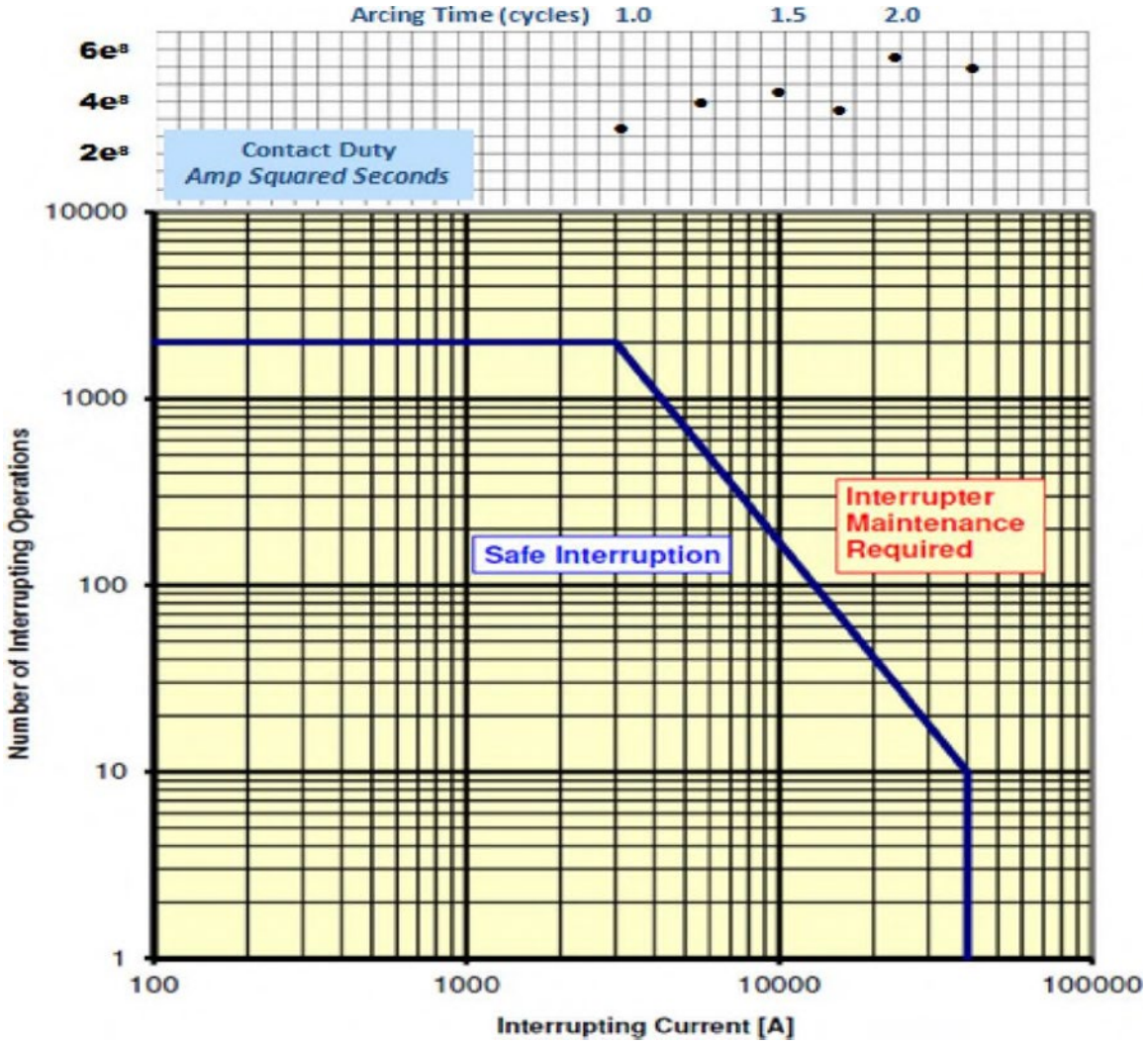
A) Inbuilt Circuit Breaker Monitor enables :

1) Finger Printing , Comparison of opening times and closing times with historical records





Measures Opening Velocity



B) It is able to monitor ONLINE continuously the following Parameters

- Partial Discharge Detection –Insulation degradation
- Condition of Temperature and humidity
- Temperature rise of the Cable Termination , Circuit Breaker Contact points , Busbar

Consequently, vital measurements required for predictive condition-based monitoring of the switchgear, circuit breakers, and bus ducts is available on both the local HMI on the switchgear , or sent through a Modbus-RTU for easy substation SCADA integration . Thus the switchgear is now brought closer to the Power Company .

Partial Discharge Detection **TEMPERATURE RECORDING**

SENSOR

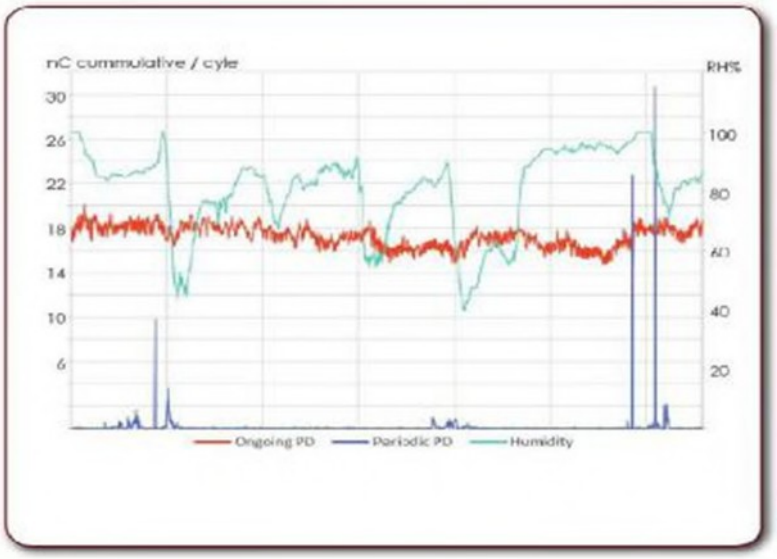
From Switchgear **From Cable Termination**

This broadband (300 MHz to three gigahertz) detection method monitors PD transient electromagnetic waves through a Sensor attached by a Electromagnet affixed to the Panel of the switchgear ..

It is capable of avoiding strong interfering signals at close proximity while advanced digital filtering methods are capable of detecting the presence of partial discharge—even with residual, unfiltered noise.

The Pd Detector for cable terminations consist of a High frequency Split Core CT mounted on the core of the incoming cable

The utilization of both sensors together significantly make 24/7 monitoring possible hence providing historical trending and information for the maintenance engineers to look out for any abnormalities.



Continuous, real-time trending of partial discharge events capturing periodic PD spikes due to condensing humidity; these events are unrecognizable with traditional (non-continuous) detection method

Temperature Monitoring

This consist of a Panel mounted monitoring unit and six separate temperature sensors mounted on the cable terminations point , Busbar surfaces and the LV Control compartment of the switchgear .Non – invasive , 24/7 real time monitoring using Surface Acoustic Wave Technology , it is great aid to the Operations and Maintenance Engine

Communication :

All the acquired information is sent from the data concentrator located in the CGIS Switchgear and sent back to the Control room via IEC 60870-5-104 over Ethernet or GSM /GPRS. No hard wired wiring is necessary .

FINAL TESTING

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